

REMARKS/ARGUMENTS

The Office action dated June 8, 2011 has been received and carefully considered. By this amendment, Claims 1, 11, and 17 are amended, and Claims 7-8 are canceled. No new Claims are added. After entry of this Amendment, Claims 1-20 will be pending. In view of the amendments and the following remarks, Applicants respectfully request reconsideration.

35 USC §103

The Office rejected **claims 1-20** as being obvious over Yao (U.S. Pat. No. 6,166,050) in view Agrawal et al. (U.S. Pat. No. 6,166,051) and further in view of Mehra (U.S. Pat. No. 5,678,854) and Jain et al. (U.S. Pat. No. 6,453,698). The applicant respectfully disagrees for various reasons, especially in view of the amendments herein.

As amended herein, claim 1 expressly requires an absorber that separately receives a first and a second portion of a feed gas vapor, that separately receives a first and a second portion of a feed gas liquid, and that separately receives a first and a second portion of a downstream distillation column overhead. Moreover, amended claim 1 also expressly requires a control unit that controls a ratio of the first and second portion of the feed gas vapor, the first and second portion of the feed gas liquid, and the first and second portion of the distillation column overhead as a function of a desired recovery rate of a feed gas component in a bottom product of a distillation column.

As amended herein, claim 11 requires an absorber and a downstream distillation column, and a step of splitting another one of the feed streams into a first and second portion, and introducing the first and second portions at different locations to the absorber, and using a flow ratio between the first and second portions of the feed streams, respectively, to control recovery of the desired product in the bottom product of the distillation column.

Similarly, amended claim 17 requires an absorber that is fluidly coupled to a downstream distillation column, and a step of controlling flow of a vapor portion of the overhead product from the distillation column to the bottom of the absorber.

(a)(i) With respect to claim 1 and all claims dependent thereon, the examiner appeared to argue that while Yao failed to teach separately receiving in an absorber first and second portions

of a feed liquid, such feeding would be a matter of common sense and motivated by ease of maintenance. The applicant can not agree as increased pipe and duct work typically complicates maintenance. Thus, if anything, the PHOSITA would be motivated to reduce the number of pipes and duct work.

More significantly, it should be noted that the separation of the two liquid streams is part of the claimed mechanism of adjusting recovery of the desired feed gas component. If one were to follow the office's suggestion to simply introduce the liquid portions at different locations, such feed scheme would still fail to read on the claimed subject matter as the ratio of the liquid streams would not be controlled as a function of the desired recovery.

(a)(ii) With respect to the examiner's argument that Agrawal would disclose separation of a distillation column overhead and separately feeding of the two resultant streams into a second column, it is noted that the distillation column overhead in Agrawals' example is from an upstream column that provides feed to a downstream column. The opposite is the case in the presently claimed subject matter where a distillation column overhead product from a downstream column is being fed at two locations to an upstream column.

It is noted that if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). See also MPEP 2143.01 VI. In the instant case, a reversal of the streams would not only materially change the principle of operation of Agrawal/Yao, but also clearly fail to provide the desired outcome as presented by Agrawal.

Moreover, it should be appreciated that Agrawal routes the two streams to the upper section of the second column, and does not route one of the streams to the bottom portion of the absorber as presently claimed. Thus, and once more, the principle of operation would be materially changed.

(a)(iii) With respect to Mehra it appears as though the examiner would use this reference to establish that a distillation overhead stream would provide an ethane-rich stream to a bottom portion of an absorber for ethane re-absorption. While applicant agrees that these isolated

features are indeed at least arguably present, applicant notes that the distillation column in Mehra is fed with feed gas condensate and not with absorber bottom product as is the case in the present inventive subject matter and Yao. Once again, the principle of operation is materially changed if one were to follow the office's reasoning.

Moreover, it is noted that Yao already recycles ethane as was properly recognized by the examiner in the rejection of claim 17. More specifically, absorber bottom stream 55 in Figure 2 of Yao is fed via line 56, exchanger 23, line 58, exchanger 12, and line 59 into suction drum, 60, from which the ethane rich vapor is recycled to the same absorber as stripping gas. Clearly, a modification as proposed by the office would yet again materially change the principle of operation of both Yao and Mehra.

(a)(iv) Regarding the examiner's arguments of modifying feed gas vapor ratios as taught by Jain, applicant agrees that the Jain reference teaches change in feed gas vapor ratios to control ethane and propane recovery. However, it should be appreciated that Yao already uses flow control of the vapor streams, but in a different context and for a different purpose (see col. 7, line 66 to col. 8, line 36). Thus, as Yao and Jain use the feed gas vapor ratios for distinct purposes, the references can not be modified with each other without rendering the original configurations inoperable for the intended purpose/materially modifying the teachings of the references.

(a)(v) Regarding the examiner's arguments with respect to the rejection of claims 7 and 8 it appears as though the office's position would be that since Yao already uses a control unit (28a) to control flow ratio of two streams, it would be obvious to also control a second and/or third flow ratio "...to produce a desired flow ratio as similarly produced by the flow control unit..." Such argument not only lacks the requisite degree of specificity (*e.g.*, with respect to flow ratios of which streams, with respect to the effect obtained, etc.), but also fails to provide any motivation (beyond the generic statement by the office to produce a desired flow rate) as to why the PHOSITA would implement such modification.

(b)(i) With respect to claim 11 and all claims dependent thereon, the examiner appeared to reply the same arguments for Yao, Agrawal, Mehra, and Jain, and the same rebuttal and reasoning as provided above applies to the examiner's rejection.

(c)(i) With respect to claim 17 and all claims dependent thereon, the examiner appeared to argue that Yao would teach use of recycled ethane stripping gas to so control the temperature of the column. Such is indeed the case. However, it must be recognized that the ethane stripping gas of Yao is directly derived from the bottom product of the same column that also receives the stripping gas, which is entirely inconsistent with providing the stripping gas from a different and downstream column. Indeed, it is the particular thermal integration scheme of Yao that demands that the stripping gas is provided from the bottom product via heat exchange with the feed gas and other streams in exchangers 12 and 23. Once more, a modification of Yao as apparently proposed by the office would materially modify the teachings of the reference. With respect to Agrawal, Mehra, and Jain, the same rebuttal and reasoning as provided above applies to the examiner's rejection.

Therefore, and in light of the above amendments and arguments, the applicant believes that the rejection of claims 1-20 as being obvious over Yao in view Agrawal et al. and further in view of Mehra and Jain et al. should be overcome.

Request For Allowance

Claims 1-6 and 9-20 are pending in this application. The applicant requests allowance of all pending claims.

Respectfully submitted,
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